Mesothelial or Endothelial?

Sir,

We were very interested to read the recent paper by Hernando *et al.*[1] This topic is especially relevant as recent clinical trials have shown endothelial cell seeding of vascular grafts can improve patency.[2] We agree that the source of these cells derived from omental fat is at present unclear. This is unsurprising as both endothelial and mesothelial cells are derived from splanchnic mesoderm. Endothelial cells (ECs) are not a single entity and there are marked differences between those derived from macro- and microvessels. Even with conventional endothelial characteristics, difficulties do arise. Hormia reported that von Willebrand Factor (vWF) expression decreases with subculturing, so that by 9th passage, it is only expressed by 50% of Human umbilical vein ECs (HUVECs). Even fibroblasts in co-culture were shown to express vWF.[3] Weibel-Palade bodies, said to be pathognomonic for ECs, are present in only 30% of cultured Huvecs[4] and they are highest in number closest to the heart and lowest in microvessels.[5]

Cells derived enzymatically from subcutaneous fat, removing the possibility of mesothelial contamination, have been shown to be endothelial by characterisation with vWF, Ulex europaeus agglutinin-1 (UEA-1), CD31 and CD34 and by transmission electron microscopy. After the use of Percoll density gradient centrifugation (commonly employed to enhance purity) there is a decrease in expression of vWF, UEA-1 and CD31 although CD34 was reported to remain expressed.[6] Where these antigens were expressed, they appeared to be in cell clusters and occasionally singly. The authors suggested that discrepancies among previous immunohistological investigations could be due to surface antigen rearrangements occurring *in vitro*. This could account for the occasional intense staining of CD34 that was encountered by Hernando *et al.*[1]

The expression of Desmin agrees with the findings of some authors, but not with Stylianou *et al.* on their characterisation of cultured mesothelium.[7] The levels of prostacyclin produced by the cells obtained by Hernando *et al.*[1] reached values similar to those produced by cultured HUVECs agree with our previously reported findings.[8] We would agree that these cells may be suitable for seeding prosthetic grafts making the question of their origin academic.

However, the properties of these different cell lines should be investigated and compared to define differences in property and function. The only way that this may be approached is by comparison of cultured cell lines at equivalent passage from pure mesothelium, micro- and macrovessels especially as expression of the various antigens may be altered by sub-culturing. Previous studies should be interpreted with caution as most have been performed on cultured cells from omentum and compared to HUVECs to determine their origin.

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References

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8 Stansby G, Shukla N, Hamilton G, Jeremy J. Comparison of prostanoid synthesis in cultured human vascular endothelial cells derived from omentum and umbilical vein. *Eur J Vasc Surg* 1991; **5**: 501–506.

Authors' Reply

We would like to thank Mr Krijgsman *et al.* for their comments on the endothelial or mesothelial origin of the cells obtained from human omentum. We agree on the need to perform in-depth studies to establish which cell markers would be most suitable to be able to definitively determine the purity of the cell strains derived from omentum. As we understand it, one of the major problems is the lack of uniformity in the methodology employed by the different authors for obtaining and separating the mesothelial and endothelial cells present in the microcirculation of omentum.